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## DIOPHANTINE ANALYSIS.

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60. Proposed by G. B. M. ZERR, A. M., Ph. D., President and Professor of Mathematics in Russell College, Lebanon, Va.

It is required to find three positive numbers, such that if each be diminished by five times the fifth power of their sum the three remainders will be rational fifth powers.

61. Proposed by SYLVESTER ROBBINS, North Branch, New Jersey.

Investigate that infinite series of prime, integral, rational scalene triangles where the sides of every term are consecutive numbers; then take the necessary factors from the proper KEY, and by an expeditious method, find in their order the areas of ten initial terms.

\*\*\* Solutions of these problems should be sent to J. M. Colaw, not later than March 1.

## AVERAGE AND PROBABILITY.

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59. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

A circle is rolling along a horizontal straight line. The uniform velocity of the center is  $v$ . Find the average velocity of a point of the circumference.

60. Proposed by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

Four points are taken at random within an ellipse. What is the chance that they form a reentrant quadrilateral.

\*\*\* Solutions of these problems should be sent to B. F. Finkel, not later than March 1.

## MISCELLANEOUS.

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58. Proposed by EDMUND FISH, Hillsboro, Ill.

The longest noonday winter shadow of an upright object is found to be seven times as long as the shortest summer shadow of the same object. Required the latitude of the place.

59. Proposed by J. A. CALDERHEAD, M. Sc., Professor of Mathematics, Curry University, Pittsburg, Pa.

When a cylindrical china jar, standing upon the ground, receives the sun's rays obliquely, a bright curve is observed to form itself at the bottom of the jar, and it is found that the shape and dimensions of this curve are not affected by the varying elevations of the sun: account for this latter circumstance, and determine the nature of the bright curve. [From *Parkinson's Optics*.]

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## EDITORIALS.

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Contributors desiring to have their portraits appear in the next group should send us a good photograph from which the plate is to be made.